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Adding and subtracting polynomials word problems

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Example problem: David gives Jim an 80-meter head start on race day. After t seconds, Jim's distance from the starting line is 7t + 80 meters, and David's distance is 8t meters. To find out how far ahead of David Jim is after t seconds, we need to subtract David's distance from Jim's distance: (7t + 80) - 8t = -t + 80. This means that after t seconds, Jim is 80 - t meters ahead of David. When working with polynomials, it's essential to understand how different operations affect them. Adding, subtracting, multiplying, or dividing one polynomial by another will always result in a new polynomial expression. This article will focus on finding unknown constants and performing multiplication and division operations on polynomials. Below are some examples of polynomial word problems that can help you grasp these concepts better: * The number of tablets sold by a shop is modeled by the expression (t), where t represents the number of months in a year, and the price per tablet is given by an expression. Using this model, we need to find the total revenue generated by the shop at the end of the year. * Exercise 7: The area of a rectangle is given by the polynomial expression and its length by . We're asked to find the width of the rectangle. * Exercise 8: The distance covered by a bike is modeled by the expression , while the time taken is given by . Our goal is to determine the speed of the bike. * Exercise 9: The number of shirts sold by a shopkeeper is represented by the expression , and the price per shirt is given by an expression. We need to find the total revenue earned by the shopkeeper. Let's consider a few problems in detail: ###Step-by-Step Solutions ####Exercise 1 To find the best maths tutors on Superprof, we follow these steps: * First, factorize the expression. * Set the factors equal to zero and solve for x: or * Substitute these values into the original polynomial expression. * Add both expressions together to get . * Finally, put this expression in the above problem and solve for a. ####Exercise 2 To determine the value of m if has as one of its roots: * Put in the original polynomial expression: 3m^4 - 9m^3 + 8 = 0. * Take 4 on the left side of the equation: 3m^4 - 5m^3 + 2 = 0. * Subtract 3 from both sides to get the final answer. ####Exercise 3 To find a fourth-degree polynomial that is divisible by and has roots by and : * Write and as and . * Multiply and together: (x+1)(x-1) = x^2 - 1. * Multiply with to get the fourth-degree polynomial: x(x^2 - 1) = x^3 - x. ####Exercise 4 To calculate the value of a for which the polynomial has the root : * Put in the polynomial expression: a + 6a^2x + 10ax^2 + 8ax^3 + 2 = 0. * Use this equation to find the value of a. ####Exercise 5 Given that the length is and width is . The area of the rectangle = length x width = = = = Hence, the area The solution to exercise 6 involves understanding that revenue equals the number of items sold times the price per item. When applying this concept, it's essential to note that in a year, there are 12 months. In solving exercise 7, we need to calculate the area and length of a rectangle to find its width. The formula for the area is length times width. To find the width, we divide the area by the length. Using polynomial long division, we can solve this expression and obtain the width of the rectangle. Exercise 8 involves finding speed using the distance formula, which is speed multiplied by time. From this formula, it's easy to derive a formula for speed by dividing both sides by time. Once values are put into the formula, it yields the speed of the bike. In solving exercise 9, we use the profit formula, which equals the price per item times the number of items sold. This involves multiplying the price of a single shirt by the total number of shirts sold to find the profit earned by the shopkeeper. Directions for answering the questions about polynomials include adding and subtracting various terms in each exercise, as well as finding missing terms in some expressions.